What Is Claimed Is:

1. An arrangement, comprising:

a computer system adapted to detect an abnormality or an inconsistency within a subject by generating internal impedance data, the internal impedance data indicating an impedance change within at least one portion of the subject, wherein the impedance change is associated with at least one of:

a change in at least one characteristic of a blood vessel within the subject, and

a presence of a foreign object within the at least one portion of the subject.

2. The arrangement of claim 1, further comprising:

an electrical stimulator adapted to apply a current to at least one pair of electrodes that are positioned in a proximity of the at least one portion of the subject; and

an analog to digital (A/D) converter adapted to measure voltage distributions resulting from the applied current, wherein the internal impedance data is generated based on the voltage distributions.

3. The arrangement of claim 1, wherein the impedance change associated with the change in the at least one characteristic of the blood vessel is at least one of:

a change in a fluid flow rate within the at least one portion of the subject, and

a change in a fluid volume within the at least one portion of the subject.

4. The arrangement of claim 3, wherein the fluid includes blood.

5. The arrangement of claim 3, wherein the at least one portion of the foreign object comprises a metal material.

6. The arrangement of claim 1, wherein the computer system generates a continuous, real time internal impedance map to detect the abnormality or

inconsistency within the subject by generating, and wherein the impedance map indicates the impedance change within the subject.

7. The arrangement of claim 1, wherein the computer system generates a plurality of static internal impedance maps to detect the abnormality or inconsistency within the subject, and wherein the impedance maps indicate the impedance change within the subject.

8. The arrangement of claim 1, wherein the subject is a human being, and wherein the computer system is further adapted to detect the abnormality or the inconsistency within the human being by generating the internal impedance data over a predetermined range of frequencies.

9. The arrangement of claim 1, wherein the at least one portion of the subject is a portion of a brain of the subject.

10. The arrangement of claim 1, wherein the at least one portion of the subject is a portion of a torso of the subject.

11. The arrangement of claim 2, wherein the electrical stimulator is a function generator.

12. The arrangement of claim 2, wherein the A/D converter is a thirty-two channel, twenty-four bit A/D converter.

13. The arrangement of claim 12, wherein the computer system is adapted to obtain spectral electrical impedance tomography recordings and electroencephalography recordings, simultaneously.

14. An arrangement, comprising:

an electrical stimulator adapted to apply a current to at least one pair of electrodes, the electrodes being positioned on at least one portion of a subject;

an analog to digital (A/D) converter adapted to measure voltage distributions resulting from the applied current; and

a computer system adapted to detect an abnormality or an inconsistency within the at least one portion of the subject by generating internal impedance data, the internal impedance data indicating the impedance change within the subject wherein the impedance change is associated with at least one of:

a change in at least one characteristic of a blood vessel within the subject, and

a presence of a foreign object within the at least one portion of the subject.

15. The arrangement of claim 14, wherein the impedance change associated with the change in the at least one characteristic of the blood vessel is at least one of:

a change in a fluid flow rate within the at least one portion of the subject, and

a change in a fluid volume within the at least one portion of the subject.

16. The arrangement of claim 15, wherein the fluid includes blood.

17. The arrangement of claim 15, wherein the at least one portion of the foreign object comprises a metal material.

18. The arrangement of claim 14, wherein the computer system generates a continuous, real time internal impedance map to detect the abnormality or inconsistency within the subject by generating, and wherein the impedance map indicates the impedance change within the subject.

19. The arrangement of claim 14, wherein the computer system generates a plurality of static internal impedance maps to detect the abnormality or inconsistency within the subject, and wherein the impedance maps indicate the impedance change within the subject.

20. The arrangement of claim 14, wherein the subject is a human being, and wherein the computer system is further adapted to detect the abnormality or the

inconsistency within the human being by generating the internal impedance data over a predetermined range of frequencies.

21. The arrangement of claim 14, wherein the at least one portion of the subject is a portion of a brain of the subject.

22. The arrangement of claim 14, wherein the at least one portion of the subject is a portion of a torso of the subject.

23. The arrangement of claim 14, wherein the electrical stimulator is a function generator.

24. The arrangement of claim 14, wherein the A/D converter is a thirty-two channel, twenty-four bit A/D converter.

25. The arrangement of claim 24, wherein the computer system is adapted to obtain spectral electrical impedance tomography recordings and electroencephalography recordings, simultaneously.

26. An arrangement, comprising:

an electrical stimulator;

a switch coupled to the electrical stimulator;

a plurality of electrodes positioned on at least one portion of a subject, wherein each of the electrodes is coupled to the switch;

an analog to digital (A/D) converter coupled to the switch and to each of the electrodes; and

a computer system adapted to detect an abnormality or inconsistency within the subject by generating internal impedance data, the internal impedance data indicating an impedance change within the at least one portion of the subject, wherein the impedance change is associated with at least one of:

a change in at least one characteristic of a blood vessel within the subject, and

a presence of a foreign object within the at least one portion of the subject.

27. The arrangement of claim 26, wherein the impedance change associated with the change in the at least one characteristic of the blood vessel is at least one of:

a change in a fluid flow rate within the at least one portion of the subject, and

a change in a fluid volume within the at least one portion of the subject.

28. The arrangement of claim 27, wherein the fluid includes blood.

29. The arrangement of claim 27, wherein at least a portion of the foreign object comprises a metal material.

30. The arrangement of claim 26, wherein the computer system generates a continuous, real time internal impedance map to detect the abnormality or inconsistency within the subject by generating, and wherein the impedance map indicates the impedance change within the subject.

31. The arrangement of claim 26, wherein the computer system generates a plurality of static internal impedance maps to detect the abnormality or inconsistency within the subject and wherein the impedance maps indicate the impedance change within the subject.

32. The arrangement of claim 26, wherein the subject is a human being, and wherein the computer system is further adapted to detect the abnormality or the inconsistency within the human being by generating the internal impedance data over a predetermined range of frequencies.

33. The arrangement of claim 26, wherein the at least one portion of the subject is a portion of a brain of the subject.

34. The arrangement of claim 26, wherein the at least one portion of the subject is a portion of a torso of the subject.

35. The arrangement of claim 26, wherein the electrical stimulator is a function generator.

36. The arrangement of claim 26, wherein the switch is a thirty-two channel matrix switch.

37. The arrangement of claim 26, wherein the A/D converter is a thirty-two channel, twenty-four bit A/D converter.

38. The arrangement of claim 37, wherein the computer system is adapted to obtain spectral electrical impedance tomography recordings and electroencephalography recordings, simultaneously.

39. The arrangement of claim 26, wherein the computer system further is coupled to the electrical stimulator.

40. An arrangement for use within a magnetic resonance imaging environment, comprising:

an electrical stimulator;

a switch coupled to the electrical stimulator via a filter;

a plurality of electrodes positioned on at least one portion of a subject, wherein each of the electrodes is coupled to the switch;

an analog to digital (A/D) converter coupled to the switch and to each of the electrodes; and

a computer system coupled to the switch and to the A/D converter, wherein the electrical stimulator applies a current to at least one pair of the electrodes, and the A/D converter measures voltage distribution and a current distribution resulting from the applied current, wherein the computer system is adapted to detect an abnormality or inconsistency within the subject by generating internal impedance data, the internal impedance data indicating an impedance change within the at least one portion of the subject, and wherein the impedance change is associated with at least one of:

a change in at least one characteristic of a blood vessel within the subject, and

a presence of a foreign object within the at least one portion of the subject.

41. The arrangement of claim 40, wherein the impedance change associated with the change in the at least one characteristic of the blood vessel is at least one of:

a change in a fluid flow rate within the at least one portion of the subject, and

a change in a fluid volume within the at least one portion of the subject.

42. The arrangement of claim 41, wherein the fluid includes blood.

43. The arrangement of claim 41, wherein the at least one portion of the foreign object comprises a metal material.

44. The arrangement of claim 40, wherein the computer system generates a continuous, real time internal impedance map to detect the abnormality or inconsistency within the subject by generating, and wherein the impedance map indicates the impedance change within the subject.

45. The arrangement of claim 40, wherein the computer system generates a plurality of static internal impedance maps to detect the abnormality or inconsistency within the subject, and wherein the impedance maps indicate the impedance change within the subject.

46. The arrangement of claim 40, wherein the subject is a human being, and wherein the computer system is further adapted to detect the abnormality or the inconsistency within the human being by generating the internal impedance data over a predetermined range of frequencies.

47. The arrangement of claim 40, wherein the at least one portion of the subject is a portion of a brain of the subject.

48. The arrangement of claim 40, wherein the at least one portion of the subject is a portion of a torso of the subject.

49. The arrangement of claim 40, wherein the electrical stimulator is a function generator.

50. The arrangement of claim 40, wherein the switch is a thirty-two channel matrix switch.

51. The arrangement of claim 40, wherein the A/D converter is a thirty-two channel, twenty-four bit A/D converter.

52. The arrangement of claim 51, wherein the computer system is adapted to obtain spectral electrical impedance tomography recordings and electroencephalography recordings, simultaneously.

53. The arrangement of claim 40, wherein the computer system is coupled to the electrical stimulator.

54. The arrangement of claim 40, wherein the computer system and the electrical stimulator are positioned externally from a magnetic resonance imaging room, and wherein the switch, the A/D converter and the electrodes are positioned inside of the magnetic resonance imaging room.

55. An arrangement, comprising:

means for applying a current to at least one pair of electrodes that are positioned on at least one portion of a subject;

means for measuring voltage distributions resulting from the applied current; and

a computer system adapted to detect an abnormality or inconsistency within the subject by generating internal impedance data, the internal impedance data

indicating an impedance change within the at least one portion of the subject, wherein the impedance change is associated with at least one of:

a change in at least one characteristic of a blood vessel within the subject, and

a presence of a foreign object within the at least one portion of the subject.

56. The arrangement of claim 55, wherein the impedance change associated with the change in the at least one characteristic of the blood vessel is at least one of:

a change in a fluid flow rate within the at least one portion of the subject, and

a change in a fluid volume within the at least one portion of the subject.

57. The arrangement of claim 56, wherein the fluid includes blood.

58. The arrangement of claim 56, wherein the at least one portion of the foreign object comprises a metal material.

59. The arrangement of claim 55, wherein the computer system generates a continuous, real time internal impedance map to detect the abnormality or inconsistency within the subject by generating, and wherein the impedance map indicates the impedance change within the subject.

60. The arrangement of claim 55, wherein the computer system generates a plurality of static internal impedance maps to detect the abnormality or inconsistency within the subject, and wherein the impedance maps indicate the impedance change within the subject.

61. The arrangement of claim 55, wherein the subject is a human being, and wherein the computer system is further adapted to detect the abnormality or the inconsistency within the human being by generating the internal impedance data over a predetermined range of frequencies.

62. The arrangement of claim 55, wherein the at least one portion of the subject is a portion of a brain of the subject.

63. The arrangement of claim 55, wherein the at least one portion of the subject is a portion of a torso of the subject.

64. The arrangement of claim 55, wherein the means for applying the current comprises an electrical stimulator.

65. The arrangement of claim 64, wherein the electrical stimulator is a function generator.

66. The arrangement of claim 55, wherein the means for measuring the voltage distributions comprises an A/D converter.

67. The arrangement of claim 66, wherein the A/D converter is a thirty-two channel, twenty-four bit A/D converter.

68. The arrangement of claim 55, wherein the computer system is adapted to obtain spectral electrical impedance tomography recordings and electroencephalography recordings, simultaneously.

69. An abnormality or inconsistency detection arrangement , comprising:

an analog to digital converter adapted to obtain spectral electrical impedance tomography recordings and current density recordings from a subject, simultaneously.

70. The arrangement of claim 69, further comprising:

a computer system adapted to detect at least one of the abnormality and the inconsistency within the subject by generating internal impedance data based on the spectral electrical impedance tomography recordings and the current density recordings, the internal impedance data indicating an impedance change within at least one portion of the subject; and

an electrical stimulator adapted to apply a current to at least one pair of electrodes positioned on the at least one portion of the subject.

71. A method of detecting an abnormality or an inconsistency, comprising the steps of:

generating internal impedance data indicating an impedance change within a subject, wherein the impedance change is associated with at least one of a change in at least one characteristic of a blood vessel within the subject and a presence of a foreign object within at least one portion of the subject; and

detecting the abnormality or inconsistency based on the internal impedance data.

72. The method of claim 71, further comprising the steps of:

applying a current to at least one pair of the electrodes which are positioned on the at least one portion of the subject; and

measuring voltage distributions resulting from the applied current.

73. The method of claim 71, wherein the impedance change associated with the change in the at least one characteristic of the blood vessel is at least one of:

a change in a fluid flow rate within the at least one portion of the subject, and

a change in a fluid volume within the at least one portion of the subject.

74. The method of claim 73, wherein the fluid includes blood, and wherein the at least one portion of the foreign object comprises a metal material.

75. The method of claim 71, wherein the step of generating the internal impedance data comprises the step of generating a continuous, real time internal impedance map indicating an impedance change within the subject.

76. The method of claim 71, wherein the step of generating the internal impedance data comprises the step of generating a plurality of static internal impedance maps that indicate the impedance change within the subject.

77. The method of claim 71, wherein the subject is a human being, and wherein the computer system is further adapted to detect the abnormality or the inconsistency within the human being by generating the internal impedance data over a predetermined range of frequencies.

78. The method of claim 71, wherein the at least one portion of the subject is one of a portion of a brain of the subject and a portion of a torso of the subject.

79. The method of claim 71, further comprising the step of simultaneously obtaining spectral electrical impedance tomography recordings and electroencephalography recordings from the subject.

80. A method of detecting an abnormality or an inconsistency, comprising the steps of:

positioning a plurality of electrodes on at least one portion of a subject;

applying a current to at least one pair of the electrodes;

measuring voltage distributions resulting from the applied current; and

detecting the abnormality or inconsistency within the subject by generating internal impedance data which indicates an impedance change within the at least one portion of the subject, wherein the impedance change is associated with at least one of:

a change in at least one characteristic of a blood vessel within the subject, and

a presence of a foreign object within the at least one portion of the subject.

81. The method of claim 80, wherein the impedance change associated with the change in the at least one characteristic of the blood vessel is at least one of:

a change in a fluid flow rate within the at least one portion of the subject, and

a change in a fluid volume within the at least one portion of the subject.

82. The method of claim 80, wherein the internal impedance data is generated using a continuous, real time internal impedance map that indicates that an impedance change within the subject has occurred.

83. The method of claim 80, wherein the internal impedance data is generated using a plurality of static internal impedance maps that indicate the impedance change within the subject.

84. The method of claim 80, wherein the subject is a human being, and wherein the computer system is further adapted to detect the abnormality or the inconsistency within the human being by generating the internal impedance data over a predetermined range of frequencies.

85. The method of claim 80, further comprising the step of simultaneously obtaining spectral electrical impedance tomography recordings and electroencephalography recordings from the subject.

86. A method of detecting an abnormality or inconsistency within a magnetic resonance imaging environment, comprising the steps of:

positioning a plurality of electrodes on at least one portion of a subject;

applying a current to at least one pair of the electrodes;

filtering the current before the current is transmitted inside the magnetic resonance imaging environment;

measuring voltage distributions resulting from the applied current; and

detecting an abnormality within the subject by generating internal impedance data that indicates an impedance change within the at least one portion of the subject, wherein the impedance change is associated with at least one of:

a change in at least one characteristic of a blood vessel within the subject, and

a presence of a foreign object within the at least one portion of the subject.

87. The method of claim 86, wherein the impedance change associated with the change in the at least one characteristic of the blood vessel is at least one of:

a change in a fluid flow rate within the at least one portion of the subject, and

a change in a fluid volume within the at least one portion of the subject.

88. The method of claim 86, wherein the internal impedance data is generated using a continuous, real time internal impedance map that indicates the impedance change within the subject.

89. The method of claim 86, wherein the internal impedance data is generated using a plurality of static internal impedance maps that indicate the impedance change within the subject.

90. The method of claim 86, wherein the subject is a human being, and wherein the computer system is further adapted to detect the abnormality or the inconsistency within the human being by generating the internal impedance data over a predetermined range of frequencies.

91. A method of detecting an abnormality or inconsistency, comprising the step of:

simultaneously obtaining spectral electrical impedance tomography recordings and electroencephalography recordings from a subject; and

detecting the abnormality or inconsistency using the simultaneously obtained spectral electrical impedance tomography recordings and electroencephalography recordings.

92. An arrangement, comprising:

a computer system adapted to detect an abnormality or an inconsistency within a subject by generating internal impedance data over a predetermined range of frequencies, the internal impedance data indicating an impedance change within at least one portion of the subject.

93. The arrangement of claim 92, wherein the computer system is further adapted to generate data associated with a flow of current through the at least one portion of the subject and to modify the data associated with the flow of current

through the at least one portion of the subject based on at least one predetermined characteristic of the subject.

94. The arrangement of claim 93, wherein the at least one predetermined characteristic is at least one of an age of the subject, a sex of the subject, and a height of the subject.

95. The arrangement of claim 93, wherein the impedance change is associated with at least one of a change in at least one characteristic of a blood vessel within the subject and a presence of a foreign object within the at least one portion of the subject.

96. A method of detecting an abnormality or an inconsistency, comprising the step of generating internal impedance data over a predetermined range of frequencies, the internal impedance data indicating an impedance change within at least one portion of the subject.

97. The method of claim 96, wherein the step of generating the internal impedance data comprises the substeps of:

generating data associated with a flow of current through the at least one portion of the subject; and

modifying the data associated with the flow of current through the at least one portion of the subject based on at least one predetermined characteristic of the subject.

98. The arrangement of claim 97, wherein the at least one predetermined characteristic is at least one of an age of the subject, a sex of the subject, and a height of the subject.

99. The arrangement of claim 97, wherein the impedance change is associated with at least one of a change in at least one characteristic of a blood vessel within the subject and a presence of a foreign object within the at least one portion of the subject.